days from the time the fly laid the eggs until a new generation of flies is produced from them.

You may think I have dwelt too long on these cases; but if you had to stand at the bed and had seen the suffering and despair of the patients and found that the worms were eating them up, you would not think so.

All these cases occurred in the month of September.

Upon this communication Dr. C. V. Riley says that the insect here referred to as attacking the human subject in Illinois, "is the *Lucilia macellaria* of Fabricius, the injuries of which to different animals are well known in the south and west, where the larva is called the 'screw-worm.' I have repeatedly endeavoured to obtain the true parent of this worm. Dr. Humbert's communication is most interesting, but the specimens yet more so, as the flies he forwards are the first that have positively been bred from the larvæ known as 'screw-worms,' and they confirm the above determination of the species. The larvæ agree with others which I have from Texas, taken from the root of the ear of a hog which had been bitten by a dog."—*Proc. U.S. Nat. Mus.* Sept. 1883, p. 103.

Fish Mortality in the Gulf of Mexico.

By S. T. Walker*.

Knowing your interest in every thing connected with fish &c., I take the liberty of giving you all the facts I have been able to collect in reference to the late mortality among the fishes in Tampa Bay and adjoining coasts. Had I known before I began my cruise of the extent of this mortality and splendid opportunities afforded of collecting specimens of strange and perhaps unknown species, I might have gone better prepared for collecting specimens; but I had only heard a few vague rumours, and I was little prepared for any thing further than a collection of facts in regard to the matter.

On leaving Clear Water, November 20, I sailed south through Boca Ceiga Bay, and encountered the first dead fish floating on the water near Bird Key, a little south-east of Pass A'Trilla. These were mullet, and as we progressed to the south and east I began to encounter toad-fish, eels, puff-fish, and cow-fish, in immense numbers, and, on attempting to land on the extreme point of Point Pinellas for the night, I was driven to my boat by the stench of thousands of rotting fish upon the beach. The next morning I went ashore and found the dead fish drifted ashore in countless numbers. The eels appeared most numerous, followed by puff-fish, cow-fish, sailor's choice, and small fish of every shape and variety. After these followed groupers, mangrove snappers, jew-fish, garpike, spade-fish, sting-rays, and sharks. Other varieties, unknown to me, were mixed among these, together with vast numbers of catfish. I saw very few mullet here.

* Letter to Prof. S. F. Baird.

At Gadsden Point about the same species appeared; while at Tampa I saw but few dead fish, and they were principally gars and catfish. From Tampa I proceeded to the mouth of the Little Manatee to obtain some information from Mrs. Hoy concerning her theory accounting for the death of the fishes. I subsequently visited the towns of Manatee, Palmetto, Bradentown, and proceeded thence to Hunter's Point, in Sarasota Pass, Longboat Inlet being the furthest point south visited. Returning, I spent several days on Anna Maria Key, where I collected the skulls of several kinds of fish; thence, passing northward by way of Passage Key, Egmont, Mullet Key, and so on back to Clear Water. From Longboat Inlet round to Mullet Key, the dead fish were principally mullet, catfish, eels, and groupers, the mullet preponderating at least ten to one. Puff-fish, toad-fish, cow-fish, and frog-fish were still extremely plentiful; indeed, I saw no diminution in their numbers, though the numbers of dead mullet had increased very greatly.

I saw many fish in every stage of sickness, from the first attack to the end. All were affected in nearly the same manner. The fish, apparently active and healthy, would be swimming along, when suddenly it would turn on its side and shoot up to the top of the water, gasping as though out of the water, apparently unable to control its motions, often lying on its side on the bottom for five or ten minutes motionless, then suddenly shooting hither and thither without aim or object, and finally ending the struggle on the surface and floating off dead. Whole schools of mullet would suddenly stand upright on their tails, spouting water, and die in five minutes. Gars would run for a long time with their snouts above the water, and then lie motionless, as if dead, for ten or fifteen minutes. These generally lived an hour or more after being attacked. I obtained specimens of water from various localities, which I send herewith, marked to show whence obtained.

Before giving the statements of others in regard to the matter, I will give you the results of my own observation in a very brief manner:—

1. The dead fish were most numerous on the outside beaches and on the inside beaches of the outer line of keys.

2. The dead fish were least numerous about the mouths of creeks and rivers, decreasing gradually as one approached such places.

3. The poisoned water was not diffused generally, but ran in streams of various sizes, as proven by fish dying in vast numbers instantly upon reaching such localities.

4. The fish were killed by a specific poison, as proven by the sickness and death of birds which ate of the dead fish.

5. The fish began dying on the outside beaches first, as Mr. Strand, assistant light-keeper at Egmont, reports them coming up first on the 17th of October, while Mrs. Hoy observed them first on the 1st or 2nd of November, at Little Manatee river.

6. The examination of many hundred recently-dead fish revealed no signs of disease. The colours were bright, the flesh firm, and the gills rosy. The stomach and intestines appeared healthy.

In my haste I have neglected to state that I saw a good many dead birds during the trip. At Tampa ducks were dying. I saw dead vultures at Anna Maria Key, and at Passage Key large flocks of cormorants were sick and dying. I also saw the carcasses of terns, gulls, and frigate-birds. The cormorants sat on the beach with their heads under their wings, and could be approached and handled.

It might be also proper to state that on Monday morning, December 14, about one hour before day, I heard a roaring south-west of Passage Key, apparently far out at sea, resembling the "blowing off" of a steam-boiler. The noise continued some ten minutes and ceased. After daylight I heard a similar roaring, which lasted about five minutes. There was no steamer in sight in the direction of the sound, and I observed no swell in the sea following it. After I got under sail I heard the noise a third time. Whether this was followed by the death of fish I am unable to say, as I did not stay to see. I mention this incidentally as a corroboration of Mrs. Hoy's statement, which is hereto appended. Whether or not either of these disturbances of the water had any connexion with the mortality among the fishes, the theory of subaqueous eruptions of poisonous gases is extremely plausible and reasonable.

Statement of Mrs. Charles Hoy, of Little Manatee.

The fish began dying here about the 1st of November. About 8 o'clock on the evening of October 28, or thereabout, I was sitting on my front gallery, the air being perfectly still and the bay calm, when I heard a heavy splashing of the water in the direction of Gadsden Point. This continued for a few minutes and was immediately followed by a roaring sound, such as might be made by the wheels of a side-wheel steamer near at hand, though the noise seemed to be several miles away. This continued for about a quarter of an hour, as near as I could guess, when it suddenly ceased. Some twenty-five or thirty minutes afterwards heavy swells began to come up the river, such as come in during a heavy blow from the north-west. These continued for a long time, gradually becoming lighter until I went to bed. In three days the fish began to come up the river dead and dying. I caught several mullet that were standing upright in the water, sick, and each had three black spots on the back, which gradually faded away. I opened the fish and could see nothing the matter with them. The flesh was natural and firm and the gills were normal.

In regard to oysters I have had a rather rough experience, and can with certainty say that they are poisonous. A few days after the fish began dying I had a quart of fine oysters for dinner. I had a lady visitor on that day, but she did not like oysters, and ate none. My daughter and I ate heartily of them, and after dinner I took my gun and went out to a pond to shoot some ducks. I took a coloured woman (my cook) along, and before I had gotten half way I began to feel weak, and a mist came before my eyes. I kept on, however, to the pond, and when I reached it was so blind I

could not see the ducks, although the water was covered with them.

With the assistance of the coloured woman I got home, when I found my daughter similarly affected and unable to walk. Neither Mrs. Simms (the visitor) nor my cook were affected, which makes me know it was the oysters. The sickness and loss of vision gradually left us after drinking a cup of strong coffee. I am confident the death of the fish is caused by the discharge of poisonous gases from the bottom of the sea.

Mr. Williams, of Point Pinellas, thinks the mortality is "caused by a black scum on the water resembling soot," and Mr. Spencer, of the Tampa Tribune, says that "the water where the fish are dying looks black and slimy;" and he ascribes this to the fall of an unusual amount of rain, the water of which, "becoming impregnated with the poison of decaying vegetation, is poured into the bay in unusual quantities and poisons the fish." Both these gentlemen allude to the unwholesomeness of the oysters; and the latter says, "the oyster-saloons here [Tampa] were obliged to close, as the oysters came near killing several people." According to MM. Forgarty and Whittaker, "the poisoned water runs in streaks," so that, of three smacks fishing in company, "two lost all their fish, while one lost none, the vessels being only a few hundred yards apart."—*Proc. U.S. Nat. Mus.*, Sept. 1883, pp. 105, 107.

On the Organization of the Crinoidea.

By M. E. Perrier.

In the course of investigations which already date from several years ago, I was led to results with regard to the organization of the arms of the Comatulæ differing considerably from those which were announced by William Carpenter, and which have been since observed and variously interpreted by Herbert Carpenter, Greef, Tauber, Ludwig, and some other observers. In consequence of the peculiar facilities for study which they presented I had made my investigations principally upon very young individuals, or upon arms in process of regeneration; it was, on the contrary, upon adult individuals, and often in full production, that the researches of the anatomists just cited were made. Hence it was probable that the divergences which existed between my original results and theirs might be due to the fact that the organization of the arms of Comatulæ undergoes important modifications with age. On the other hand, there are also serious divergences between the conclusions at which the various observers have arrived; and the publications of Ludwig have recently diffused ideas with respect to the Echinoderms which require to be rectified upon many points, ideas which we believe we have demonstrated to be incorrect with regard to the circulatory apparatus of the Urchins and Starfishes, and which would render any homology very difficult to establish in the group Echinodermata, if we accepted them for the Crinoids. This is